

CLAIMS

1. A front grille for attachment to a front part of a vehicle, the front grille comprising:

5 a grille main body forming a part of a design surface of the vehicle;

an attaching portion for attaching the grille main body to the vehicle; and

10 a portion to be deformed which is deformed when a load acts.

2. The front grille according to claim 1, wherein the portion to be deformed comprises a cutout portion.

15 3. The front grille according to claim 2, wherein the cutout portion is a triangular groove.

20 4. The front grille according to claim 1, wherein the grille main body comprises a frame portion, and a grille portion disposed on an inner periphery of the frame portion, and wherein the portion to be deformed comprises at least one joint portion having a width smaller than that of the grille portion when the grille main body is seen from the front.

25 5. The front grille according to claim 1, wherein the grille main body comprises a first resin portion which is molded using a first resin material, and wherein the portion to be deformed comprises a second resin portion which is disposed in the first resin portion and which is molded using 30 a second resin material having a rigidity lower than that of the first resin portion.

35 6. The front grille according to claim 1, wherein the grille main body comprises a frame portion, and a grille portion disposed on an inner periphery of the frame portion,

and wherein the portion to be deformed is disposed in a connecting portion between the frame portion and the grille portion.

5 7. The front grille according to claim 1, wherein the grille main body comprises a vertical grille portion extending vertically in the inner periphery of the frame portion, and a transverse grille portion disposed to be orthogonal to the vertical grille portion, and wherein the portion to be deformed is disposed on at least one of a connecting portion between the frame portion and the vertical grille portion, a connecting portion between the frame portion and the transverse grille portion, and a connecting portion between the vertical grille portion and the transverse grille portion.

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15 8. The front grille according to claim 4, wherein the frame portion comprises, a bent portion bent rearward from the vehicle front part, and wherein the portion to be deformed is disposed on the bent portion.

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25 9. The front grille according to claim 7, wherein the grille main body comprises at least one vertical grille portion, and at least one transverse grille portion, and wherein the vertical grille portion is connected to the transverse grille portion so as to form a T or inverted T shape.

30 10. The front grille according to claim 1, wherein the portion to be deformed is formed on at least one of the grille main body and the attaching portion.

35 11. The front grille according to claim 1, further comprising a fixing member for fixing the front grille to a body of the vehicle,

wherein the attaching portion comprises a first resin

portion in which a through hole capable of passing the fixing member is formed, and

wherein the portion to be deformed comprises a second resin portion which has a rigidity lower than that of the first resin portion and which is disposed between the grille main body and the first resin portion to connect the grille main body to the first resin portion.

12. The front grille according to claim 11, wherein step portions are disposed on one of the first and second resin portions and one of the second resin portion and the grille main body, and bonding portions to be bonded to the step portions are disposed on the other of the first and second resin portions and the other of the second resin portion and the grille main body.

13. The front grille according to claim 1, further comprising a fixing member for fixing the front grille to a body of the vehicle,

20 wherein the attaching portion comprises a first resin portion protruding from the grille main body, and the first resin portion comprises an elongated hole capable of passing the fixing member and allowing displacement of the fixing member along the protruding direction of the first resin portion, and

25 wherein the portion to be deformed comprises a second resin portion which has a rigidity lower than that of the first resin portion and which has an insertion hole capable of passing the fixing member in a position in the elongated hole on a tip side of the first resin portion and which is superposed upon the first resin portion so as to be exposed in the elongated hole.

30 14. The front grille according to claim 1, wherein the vehicle includes a body, the front grille further comprising a

fixing member for fixing the front grille to the body of the vehicle,

wherein the attaching portion comprises a resin portion protruding from the grille main body, and the resin portion 5 comprises an elongated hole capable of passing the fixing member and allowing displacement of the fixing member along a protruding direction of the resin portion, and

wherein the portion to be deformed comprises at least one rib disposed in the elongated hole.

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15. The front grille according to claim 1, wherein the vehicle includes a body, the front grille further comprising a fixing member for fixing the front grille to the body of the vehicle,

15 wherein the attaching portion comprises a first resin portion in which a through hole having an inner diameter larger than an outer diameter of the fixing member, and

20 wherein the portion to be deformed comprises a second resin portion which has a rigidity lower than that of the first resin portion and which is disposed in the through hole and which is capable of passing the fixing member.

25 16. The front grille according to claim 1, wherein the vehicle includes a body, the front grille further comprising a fixing member for fixing the front grille to the body of the vehicle,

30 wherein the attaching portion comprises a resin portion protruding from the grille main body, and the resin portion comprises an insertion hole capable of passing the fixing member; and

wherein the portion to be deformed comprises a cutout portion formed in a connecting portion between the attaching portion and the grille main body.

35 17. A front grille for forming a part of a design

surface of a vehicle, the front grille comprising a part formed of a soft synthetic resin.

18. The front grille according to claim 17, further
5 comprising a grille main body formed of a plurality of synthetic resin layers different from one another in modulus in flexure, wherein a layer forming the surface of the grille main body comprises a synthetic resin softer than that of another layer.

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19. The front grille according to claim 18, wherein the layer forming the surface of the grille main body comprises a synthetic resin having modulus in flexure in the range of 500 to 1500 MPa.

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20. The front grille according to claim 17, further comprising a grille main body formed of a plurality of synthetic resin layers different from one another in modulus in flexure, wherein a layer forming the surface of the grille main body comprises a synthetic resin harder than that forming another layer.

21. The front grille according to claim 18, wherein the layer forming the surface of the grille main body comprises a synthetic resin having modulus in flexure in the range of 1500 to 3000 MPa.

22. The front grille according to claim 18, wherein the layer forming the surface of the grille main body comprises a synthetic resin softer than that of a layer forming a back surface.

23. The front grille according to claim 1, further comprising a grille main body and a frame portion, wherein the frame portion is formed of a synthetic resin harder than that

of the grille main body.

24. The front grille according to claim 23, wherein the grille main body is formed of a synthetic resin having modulus in flexure in the range of 500 to 1500 MPa.
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25. The front grille according to claim 23, wherein the frame portion is formed of a synthetic resin having modulus in flexure in the range of 1500 to 3000 MPa.

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26. A shock reducing device including the front grille of the vehicle according to claim 23, the shock reducing comprising:

15 a predicting device for predicting a collision of the vehicle; and

an operation device for pushing at least the grille main body of the front grille forward, when the predicting device predicts a collision of the vehicle.

20 27. The front grille of the vehicle according to claim 23, wherein the grille main body comprises an attaching portion, and wherein the grille main body is attached to the vehicle via the attaching portion.

25 28. A shock reducing device for use with a vehicle, the shock reducing device comprising:

30 a front grille including a grille main body for forming a part of a design surface of the vehicle and comprising a synthetic resin having a modulus in flexure in the range of 500 to 1500 MPa;

a predicting device for predicting a collision with the front of the vehicle; and

35 an operation device for pushing the grille main body forward from the vehicle, when the predicting device predicts a collision.